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Analysis and demographic characteristics of maxillofacial trauma patients

Maxillofacial trauma patients in emergency department

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Abstract
Aim: Maxillofacial fractures are common in trauma patients. In our study, we aimed to analyze the demographic and clinical characteristics of maxillofacial fracture patients admitted to our tertiary care hospital.
Material and Methods: Among the trauma patients admitted to our tertiary care emergency setting from January 2014 to December 2019, 177 patients with maxillofacial trauma were included in the study.
Results: Of the patients, the mean age was 27.11 ± 20.24 years and 75.7% were male. Mandibular fractures were the most common type (26%). Corpus and symphyseal fractures were the most common in the mandible fractures. Two of our patients (1.1%) died and 70 patients (39.5%) underwent surgical intervention.
Discussion: Mandibular fractures and soft tissue injuries are the most common findings observed in maxillofacial traumas. Of these patients, 37.3% were hospitalized and 39.5% underwent surgical interventions.

Keywords
Maxillofacial trauma; Emergency department; Mandible

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Introduction

Maxillofacial fractures are common in trauma patients. The incidence of maxillofacial fractures is variable based on the location. These fractures may be isolated or combined with other fractures [1]. Being the most visible area in the human body, the face is significantly important for an aesthetic outlook. Maxillofacial fractures may cause aesthetic and functional deficits which may have substantially untoward consequences on social activities [2]. The epidemiology of facial fractures may vary depending on the type, severity, and cause of injury. Understanding these factors can help achieve effective treatment outcomes and clinical studies may contribute to preventing these types of injuries [3]. In this retrospective study, we aimed to analyze the demographic and clinical characteristics of maxillofacial trauma patients admitted to our tertiary care hospital.

Material and Methods

Our study was performed as a retrospective cross-sectional clinical study. This study included maxillofacial trauma patients among the individuals admitted to our tertiary care emergency department due to trauma from January 1, 2014 to December 31, 2019. The patient information was accessed via the hospital information processing database system and the patients with complete information in their records were included in the study. The demographic data of the patients such as identity information, age, gender, complaints, type of trauma, and the fracture location were recorded in the data form. For statistical analysis, the software package SPSS version 18.0 was used. Continuous variables were presented as mean ± standard deviation. The descriptive statistics of the categorical variables were shown as percentages (%).

Results

The mean age of the 177 patients included in the study was 27.11 ± 20.24 years (1-83 years). Of the study patients, 134 (75.7%) were male and 43 (24.3%) were female. When the mechanisms of trauma found in the patients were examined, it was found out that falls (49.2%) were the most common type. Other reasons for trauma are summarized in Figure 1.

There were no maxillofacial fractures in 63 (35.6%) patients. The most common type was mandibular fractures in 46 patients (26%), followed by zygomatic and nasal fractures with frequencies of 11.3% and 7.3%, respectively (Table 1).When the mandibular fractures were examined in subcategories, corpus and symphyseal-parasymphyseal fractures were the most common (Figure 2). Accompanying soft tissue trauma was found in 109 (61.6%) patients as edema and ecchymosis and in 25 (14.1%) patients as incisions and lacerations. Other fractures in other regions of the body were identified in 20 (11.2%) patients.

Eighty-five patients (48%) were discharged from the emergency department. Sixty-six patients (37.3%) were hospitalized. Twenty-four patients (13.6%) were admitted to the intensive care unit and 2 patients (1.1%) died. While 107 patients (60.5%) did not require surgery, 70 patients (39.5%) underwent surgical intervention.

Table 1. Distribution of patients by the fracture site

	n	%
No fractures	63	35.6
Nasal fractures	13	7.3
Orbital floor fractures	4	2.3
Maxilla fractures	7	4
Orbital + maxillary fractures	8	4.5
Zygomatic fractures	20	11.3
Maxilla + Zygomatic bone	3	1.7
Frontal + Orbital fractures	3	1.7
Multiple fragmented fractures	7	4.0
Frontal fractures	3	1.7
Mandibular fractures	46	26
Total	177	100

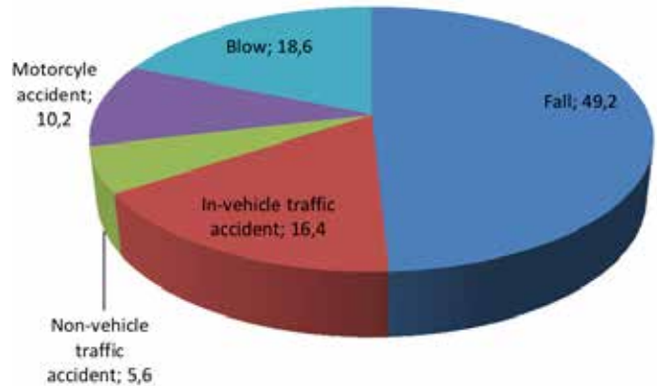

Figure 1. Mechanisms of trauma

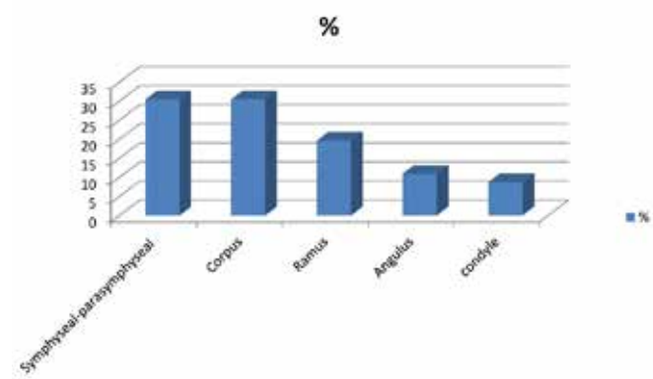

Figure 2. Subcategories of mandibular fractures

Discussion

Trauma is the leading cause of death in the first 40 years of life. Although studies conducted in different geographical regions report a wide age distribution, maxillofacial trauma is most commonly seen in the third decade. In our study, the mean age of the patients was 27.11 ± 20.24 years; however, the age distribution ranged from one year to 83 years of age. Maxillofacial trauma is usually seen in men [1-5]. The male gender was predominant in our study, too, in alignment with the literature.

A review of the literature about the causes of maxillofacial trauma demonstrated that they vary depending on regional and sociocultural differences. The most common causes of trauma were reported to be daily life accidents and game and sports injuries by Gassner et al., traffic accidents (43.39 %) and blows (23.45 %) by Manodh et al., motor vehicle accidents by Boonkasem et al., and falls (32.5%) by Park et al [1-4]. In our study, falls and traffic accidents were the most common causes of trauma. We suggest that the underlying reason for this finding is the location of our country in an agricultural and tourism region at the crossroads of transportation.

A literature review about the types of maxillofacial fractures revealed that the most common types of fractures were reported to be mandibular fractures (59.2%) by Manodh et al., zygomatic fractures (37.2%) by Boonkasem et al., nasal fractures (61.7%) by Park et al., and midfacial fractures (71.5%) by Gassner et al [1-4]. In our study, the most common type was the mandibular fractures (26%). This diversity in the literature can be explained by the different causes of trauma.

The location of the fractures in the mandible was reported to be most common in the mandibular angle (22.6%) in the Park et al.'s study; however, Pungrasmi et al. reported symphyseal-parasymphyseal fractures and Manodh et al. reported parasymphyseal fractures as the most common locations for fractures [1]. In our study, the symphyseal-parasymphyseal fractures (30.4%) and mandibular corpus fractures (30.4%) were the most common. In the study by Manodh et al., accompanying soft tissue injuries were present in 41.2% of the patients; however, they were found in 75.3% of the patients in our study. In our study, 39.5% of the patients underwent open and closed surgical interventions and 37.3% of the patients were hospitalized in various specialty services. Manodh et al. reported that 26.44% of the patients were treated with closed reduction and 73.56% were treated with open reduction methods [1]. In a 312-patient study by Boonkasem et al., it was reported that 210 patients underwent open surgical interventions [1]. Pungrasmi et al. conducted a 1,275-patient study, reporting that 58.6% of the patients underwent surgery [1]. Al-Qamachi et al.'s study reported that 38% of the patients underwent medical and surgical treatment and 23% of the patients were hospitalized [1].

Since the most important limitation of our study was its retrospective design, we could not find patient data about the length of hospital stay, follow-up periods or the surgical methods used in treating the patients. In conclusion, mandibular fractures accompanied by soft tissue injuries are the most common lesions in maxillofacial trauma. Of our study patients, 37.3% were hospitalized and 39.5% underwent surgical intervention. To gain a better insight into maxillofacial trauma, well-designed and well-conducted prospective studies are needed.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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